

KEYED INSERT FOR DISPENSING OF LAUNDRY ADDITIVES IN AUTOMATIC MACHINE

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CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of: provisional application U.S. Serial No. 60/526,642 filed December 3, 2003 and is a continuation-in-part of: U.S. Serial No. 10/366,204, filed February 13, 2003 which claims the benefit of provisional application U.S. Serial No. 60/356,544, filed February 13, 2002; U.S. Serial No. 10/366,100, filed February 13, 2003 which claims the benefit of provisional application U.S. Serial No. 60/356,543, filed February 13, 2002; U.S. Serial No. 10/289,936, filed November 7, 2002; and U.S. Serial No. 10/737,429, filed December 16, 2003 which claims the benefit of provisional application U.S. Serial No. 60/435,646, filed December 20, 2002.

Technical Field

The present invention relates to systems, methods and devices for adding separate laundry additive materials to the drum (tub) of an automatic fabric laundering (washing) machine during its cycle of operation. The separate laundry additive materials themselves are packaged in a unit dose form which is inserted into a holder device within the washing machine drum in order to effect dispensing of the materials into the drum.

Background of the Invention

There are a great many types of laundry additive materials suitable for use in automatic washing machines for fabric laundering. Cleaning agents such as surfactants and detergent builders are used to assist in the mechanical removal of soil and stains from fabrics being laundered. Bleaching agents, enzymes and adjuvants relating thereto are designed to promote chemical degradation and removal of soils and stains. Fabric conditioners, softeners, anti-wrinkle agents, soil release materials and similar agents serve to alter and enhance the condition, appearance or feel of laundered fabrics. Other auxiliary materials, such as pH adjustment and control agents, buffers, solvents, dispersants, anti-redeposition agents, dye transfer inhibitors, stabilizers, preservatives, perfumes, dyes and

the like are used to alter the aqueous environment in the automatic washing machine drum to provide for optimum performance of the active laundry additive materials or to improve the quality or aesthetics of commercialized laundry products containing these active additive materials.

The several types of laundry additive materials described hereinbefore, frequently intermingled or admixed together in a wide variety of combinations for convenience, are commonly marketed to consumers in bulk quantities, in either solid, i.e., granular or tablet, or liquid form. To carry out the laundering operation, the consumer then adds aliquots of product as needed or desired from the bulk products into the automatic washing machine drum in appropriate amounts and at appropriate times during the laundering cycle.

A number of attempts have been made, to market fabric laundering products in "unit dose" form whereby aliquots of combinations of laundry additive materials are provided in pre-measured, pre-packaged form. The consumer can then conveniently add one of these unit dose aliquots to the automatic washing machine, e.g., into the drum, at the beginning of the laundry cycle and not have to measure product from bulk or add product to the cycle at different subsequent points in time.

Several factors complicate the provision of multiple types of laundry additive materials in unit dose form. In the first place, many types and forms of laundry additives are not compatible with each other within a single concentrated product. Different types of materials may chemically interact with each other when admixed in concentrated form, thereby degrading and rendering one or both types ultimately ineffective for its intended purpose. Such incompatibility works against combining such materials together within a single unit dose product.

Secondly, during the laundering cycle itself, different types of laundry additives work best under different sets of conditions which occur as the laundering operation progresses through its cycle which generally includes washing and rinsing stages within the drum. It therefore becomes advantageous to add different types of laundry additives to the washing machine drum at different times during the laundering cycle. This timed or staged addition of separate, distinct materials to the automatic washing machine drum is also difficult to accomplish with product packaged in unit dose form.

Given the foregoing difficulties in formulating unit dose products for use in fabric laundering operations carried out in a multi-cycle, drum-containing automatic washing machine, it is desirable to provide a system which can effectively utilize laundry additive products in unit dose form to deliver a wide variety of ingredients to the drum of an automatic fabric laundering machine during its operational cycle. This is realized by providing a unit dose in the form of a package having at least one compartment. Such a package is then placed as an insert into a housing device which is positioned within the washing machine drum and which serves to bring about the dispensing of laundry additives from the several compartments of the insert. Additionally due to these formulating difficulties, it is important that the supplier of these products be able to control their use so that materials that are inferior or improperly selected or formulated cannot be used with the dispenser system and cannot be passed off as the laundry additive materials of the supplier. If improper laundry additives are used in the dispenser, they could damage the supplier's reputation and/or diminish the supplier's good will. Additionally, if the laundry additives are not contained in the correct compartments, the wrong additive may be released at any given time in the laundry cycle. Thus, in addition to providing a system for adding laundry additives during the laundry cycle, a system is also desired that enables the supplier to control the quality and use of the laundry additives used in the system.

Summary of the Invention

In order for the laundry dispenser device to work effectively, there is a need to ensure that the inserts are positioned properly in the housing so that the correct laundry additives are released at the correct time during the laundry cycle. Furthermore, there is a desire by the manufacturer of the laundry dispenser device that only the manufacturer's products are used in the dispenser to maintain product quality. In order to achieve this, inserts are designed with a "key," so that only inserts with the key can be used with a housing having a corresponding feature (a "lock"). The key has a characteristic shape that interfaces with a corresponding shape in the housing both to ensure that the insert is positioned properly in the housing and to maintain product quality by providing that only inserts having the key are receivable and/or useful with the housing. In this way, the supplier of the housing can ensure that only laundry additive materials that are compatible with the system are used in association with the housing.

One non-limiting embodiment of the present invention is an insert which can be placed within a housing structure mounted in a washing machine drum. The insert comprises at least one compartment for containing one or more laundry additive materials which are to be added at the same or different times to the contents of the washing machine drum during the laundering cycle. The insert further comprises a key having a characteristic shape that interfaces with a corresponding shape in the housing to prevent the insert from being improperly positioned in the housing.

Another embodiment of the present invention is a system for dispensing laundry additive materials into the one or more stages of the laundering cycle which occur during the operation of a drum-containing automatic fabric laundering washing machine. This system comprises: a housing structure positioned within the washing machine in a fixed spatial relationship to the washing machine drum. The housing structure comprises a base and an openable and closable lid for the base; and an insert which can be placed within the housing structure. The insert comprises at least one or more compartments for containing one or more laundry additive materials which are to be added at the same or different times to the contents of the washing machine drum during the laundering cycle. The insert further comprises a key having a characteristic shape that interfaces with a corresponding shape in the housing to ensure that the insert is properly positioned in said housing. In one embodiment of the invention, the insert is placed in the housing and the housing is placed in the laundry drum at the beginning of the laundry cycle.

Brief Description of the Drawings

Figure 1A and 1B of the drawings show a front and back view of a unit dose insert positioned within a closed housing structure suitable for practice of the present invention.

Figures 2A and 2B of the drawings show a front and side view of the insertion and use of a multi-compartmented unit dose insert into one embodiment of a lidded, rigid housing structure suitable for the practice of the present invention.

Figure 3 shows the insert with a "key" feature being used in a housing structure with a base having a corresponding feature in accordance with one embodiment of the invention.

Figures 4 and 4B show the insert with a “key” feature being used in a housing structure with a lid having a corresponding feature in accordance with another embodiment of the invention.

Figure 5 shows a front view of an insert with a key in accordance with one embodiment of the invention.

Figure 6 shows a front view of an insert with a key in accordance with another embodiment of the invention.

Figure 7 shows a front view of an insert with a key in accordance with yet another embodiment of the invention.

Figure 8 shows a front view of an insert with a key in accordance with yet a further embodiment of the invention.

Detailed Description of the Invention

Figure 1A shows a front view of an insert 40, such as depicted in Figures 5-8, which has been inserted into a housing structure 41 which has been closed with the insert 40 inside. The housing structure 41 itself comprises a base plate 42 surrounded by a side wall structure 43 affixed to the base plate 42. A lid 44 completes the housing structure and is affixed to the sidewall structure 43 by means of a hinge pin 45. More details of the internal components of the housing structure 41 are shown in the views of Figure 2A and 2B. The housing structure is formed from a rigid plastic material in one embodiment of the invention. The housing structure includes openings such as the u-shaped collar opening 47 and the side opening 48 that enable water to easily flood the dispenser.

Figure 1B shows a back view of a lidded housing structure 41. The base plate 42 comprises attachment means 61 which may be used to affix the housing structure 41 to the inside wall of an automatic washing machine drum (not shown). The attachment means 61 is further described in U.S. Application Serial No. 60/435,646 filed December 20, 2002 and non-provisional U.S. Application Serial No. 10/731,429 filed December 16, 2003. The housing structure 41 is affixed to the washing machine drum in a manner such that the base

plate 42 is parallel to the axis of the washing machine drum and is hence perpendicular to the direction of centrifugal force which arises during the washing machine spin cycle.

Figure 2A shows a progression from left to right in the drawings in which the housing structure 51 shown partially inserted into the housing structure 51, followed with the insert 50 shown fully inserted, and finally showing the insert 50 fully inserted with the lid 54 fully closed. Figure 2B shows the same progression. The insert 50 is shown as comprising wash additive compartments and/or rinse additive compartments 70, 71. The insert 50 is inserted into the housing structure with the compartments 70, 71 positioned toward the housing structure lid. The lid 54 is opened by squeezing the ends 55 of the lid 54 and moving the lid 54 away from the base of the base plate 52. The insert 50 is slid into the lid 54 so that when the lid 54 is closed, the latching mechanism 62 is engaged. In one embodiment as a consequence of closing and latching, the compartments 70 and 71 of the insert 50 impinge upon a pair of puncturing elements 63 associated with the base plate 52. This action punctures the compartments 70 and 71 of the insert 50. The contents of the compartments 70 and 71 are not dispensed if the resulting punctures are well above the contents contained within the compartments 70 and 71 in this embodiment.

One embodiment of the present invention relates to inserts used to dispense laundry additive materials into the drum of an automatic washing machine as that machine is used for fabric laundering operations. More specifically, the inserts of the present invention include a key. The term "key" includes features that interface with corresponding features in the housing to ensure that the insert is positioned properly in the housing or to ensure that inserts that do not have the key cannot be used in association with housing. Non-limiting examples of suitable keys include apertures, notches, extensions, tabs, and/or protrusions on the insert that interface with corresponding features or shapes in the housing. For example, the key can be an aperture in the insert and the aperture can be any geometric shape that will interface with a corresponding structure, such as a post, in the housing. The key can also be a protrusion, extension or post on the insert that will interface with a corresponding feature on the housing. The key can also be a combination of apertures, notches, extensions, tabs or protrusions on the insert that interface with a corresponding combination of features in the housing. The examples mentioned are for the purpose of illustration. Those skilled in the art will recognize that a variety of shapes and features can be used as the key.

Figure 3 shows the insert with a semi-circular “key” feature being used in a housing structure with a base having a corresponding feature in accordance with one embodiment of the invention. Figure 3 shows an insert 80 having a U-shaped notch 81 at the bottom of the insert 80 that functions as a key. In effect, the key allows the insert 80 to be used with a housing with a base 82 having a U-shaped abutment 83 at the bottom of the base 82. Conversely, inserts that do not have the U-shaped notch at the bottom of the insert cannot be used in the housing structure having such a corresponding feature. Accordingly, the key ensures that the insert is positioned properly in the housing and that inserts that do not have the key features with this specific housing cannot be used.

Figure 4A shows the insert 90 with a “key” feature being used in a housing structure with a lid 92 having a corresponding feature in accordance with another embodiment of the invention. Figure 4 shows an insert 90 having a U-shaped notch 91 at the bottom of the insert 90 that functions also as a key. In effect, the key would allow the insert 90 to be used with a housing with a lid 92 having a U-shaped abutment 93 at the bottom of the lid 92. Conversely, inserts that do not have the U-shaped notch at the bottom of the insert cannot be used in the housing structure having such a corresponding feature. Accordingly, the key ensures that the insert is positioned properly in the housing and that inserts that do not have the key features with this specific housing cannot be used. The lid 92 also includes an angled wall 94 as shown in Fig. 4B that inserts into the space 95 between the compartments 96 and 97.

The unit dose insert, the housing structure and their relationship to each other for use in the systems and methods and kits herein are all illustrated further by the accompanying drawings. Figures 5-8 show front views of the insert with various “key” features in accordance with different embodiments of the invention.

Figure 5 of the drawings shows a two-compartment unit dose insert 100 which can be employed in the practice of the present invention. This compartmented unit dose insert 100 can be made of a material such as thermoformed polypropylene (other materials are discussed below). It has a compartment 102 suitable for storage of liquid laundry additive, such as heavy duty liquid detergent, to be dispensed into the wash cycle of a laundering operation. The two-compartment unit dose insert 100 also has a smaller minor

compartment 101 suitable for holding a liquid laundry additive, non-limiting examples of which include a fabric conditioning agent or pH control agents, to be dispensed into the rinse cycle of the laundering operation. Prior to use, both compartments are sealed across the back with a puncturable or rupturable layer of a material, non-limiting examples of which include film or foil which covers both compartments 101 and 102. Furthermore, the compartments 101, 102 have V-shaped bottoms 103, 104. The compartments 101, 102 are contiguous and the key is formed by the space 105 between the V-shaped bottoms of the compartments. The insert 100 would be used with a housing having a feature that can be in the lid or the base having a shape corresponding to the shape of space 105 to ensure that the insert is positioned properly. Furthermore, inserts that do not have the key as shown in Figure 5 cannot be used in the aforementioned housing. One advantage of the V-shaped bottom is that it provides a key structure but also facilitates draining the additive from the compartments. In addition to V-shaped bottoms, the compartments could be formed with other shaped bottoms that give the insert a unique shape.

Figure 6 shows an insert 110 having compartments 112 and 113 for laundry additives with a different key feature in accordance with another embodiment of the invention. The insert 110 includes a triangular aperture 115 that functions as a key. The key would allow the insert to be used with a housing having a protruding feature such as a post corresponding in shape to the triangular aperture. Conversely, inserts that do not have the triangular aperture cannot be used in the housing having the corresponding feature to the triangular aperture. Other shaped apertures could also be used such as circular or polygonal shaped. An additional key feature for this insert is the V-shape of the bottom 111 of the insert 110. This V-shaped bottom 111 of the insert 110 would be usable in a housing having the corresponding feature to this V-shape bottom 111, for example, a housing having a V-shaped slot in the lid so that only inserts with the V-shaped bottom can be used with the specific housing. Accordingly, the key ensures that the insert is positioned properly in the housing and that inserts that do not have the key features with this specific housing cannot be used. The shape of the compartments 112 and 113 also cooperates with the puncturing elements indicated by the dotted lines 114 that are provided in the dispenser base to puncture the compartments when the insert 110 is inserted.

Figure 7 shows another insert 120 with yet another key feature in accordance with another embodiment of the invention. The insert 120 has compartments 122 and 123 and a triangular aperture 125 that functions as a key. In addition, the insert 120 has a V-shaped notch 121 at the bottom of the insert that functions also as a key. The key would allow the insert to be used with a housing having both a corresponding feature to the triangular aperture 125 and a corresponding feature to the V-shaped notch 121. For example, a corresponding feature to the V-shaped notch 121 may be a V-shaped slot in the housing lid so that only inserts with the V-shaped notch 121 can be used with this particular housing. Additionally, the shape of the compartments parallels the puncturing elements 124 in the base of the dispenser. When placed in the slot and the lid is closed, the aperture 125 would slide over or receive a triangular shaped post in the housing. Conversely, inserts that do not have both the triangular aperture and the V-shaped notch at the bottom of the insert cannot be used in the housing having such corresponding features. Accordingly, the key ensures that the insert is positioned properly in the housing and that inserts that do not have the key features with this specific housing cannot be used.

Figure 8 shows another insert 130 with a key feature in accordance with another embodiment of the invention. The insert 130 has compartments 132 and 133 and a post 135 that functions as a key. In addition, the insert 130 has a U-shaped notch 131 at the bottom of the insert that functions also as a key. In effect, the key would allow the insert 130 to be used with a housing having both an aperture to receive the post 135 and a U-shaped abutment at the bottom of the lid. Conversely, inserts that do not have both the post and the U-shaped notch at the bottom of the insert cannot be used in the housing having such corresponding features. Accordingly, the key ensures that the insert is positioned properly in the housing and that inserts that do not have the key features with this specific housing cannot be used.

The insert in accordance with the invention can be used in a wide variety of dispensers. A number of dispensers have been disclosed which mount on a wash drum and dispense laundry additive materials. The dispensers described in the following are for the purposes of illustration only. The insert of the present invention is not limited to use in these dispensers only.

One example of a dispenser is described in U.S. Publication No. 2003/0172960 published on September 18, 2003. The dispenser is directed to an arrangement of mechanical elements which provides for the timed dispensing of rinse additive materials into the rinse stage of the laundering cycle which occur during the operation of a drum-containing automatic fabric laundering machine. Such an arrangement comprises a rigid housing structure positioned within the washing machine drum, a unit dose package which can be placed as an insert within the housing and which contains the rinse additive materials to be dispensed into the washing machine drum, means for opening the insert to permit the release of its contents into the housing structure, and means for permitting flow of the emptied rinse additive materials from the housing structure into the washing machine drum. The dispenser comprises a means to open at least the rinse additive-containing compartment(s) of the unit dose insert. The opening of this compartment(s) occurs after initiation of the spin cycle of the washing machine operation, and the means for opening this compartment(s) of the insert are activated by the centrifugal force which arises as a consequence of running through the spin cycle during the operation of the washing machine. The opening of the rinse additive compartment(s) of the insert permits the emptying of the compartment contents within the housing structure. These emptied or emptiable contents are then held within the housing structure by the spin cycle centrifugal force and emptied into the washing machine drum upon commencement of the rinse cycle. An insert having a key in accordance with the present invention can be used with the foregoing dispenser.

A second example of a dispenser is described in U.S. Publication No. 2003/0172961 published September 18, 2003. The dispenser is directed to an arrangement of mechanical elements which provides for the sequential dispensing of laundry additive materials into the several stages of the laundering cycle which occur during the operation of a drum-containing automatic fabric laundering machine. Such an arrangement comprises a rigid housing structure positioned within the washing machine drum, a multi-compartmented insert which can be placed within the housing and which contains the laundry additive materials to be dispensed into the washing machine drum, and a means for opening the compartments of the multi-compartmented insert. The dispenser has means associated with it which serve to open at least a first compartment of the multi-compartmented insert upon closing of the lid of the housing structure after the insert has been positioned within the

housing structure. The opening of the first compartment(s) permits the dispensing of the contents of the opened compartment(s) into the washing machine drum at the beginning of the washing cycle. The dispenser also comprises additional means associated with either the housing structure or with the insert or with both to open one or more additional compartments of the insert. Such additional compartment(s) contain laundry additive material(s) which is/are different from that in at least one of the previously opened compartments of the insert. The opening of these additional compartments occurs after initiation of the spin cycle of the washing machine operation, and the means for opening the additional compartments of the insert are activated by the centrifugal force which arises as a consequence of running through the spin cycle during the operation of the washing machine. As with the opening of the first compartment(s), the opening of the additional compartment(s) of the insert permits the dispensing of the compartment contents into the washing machine drum. An insert having a key in accordance with the present invention may be used with the foregoing dispenser.

A third example of a dispenser described in U.S. Patent Application Serial No. _____ entitled Universal Dispenser for Selective Dispensing of Laundry Additives During Automatic Machine Laundering of Fabrics filed on even date herewith (Procter & Gamble Docket No. 9505). That dispenser provides for the selective dispensing of laundry additive materials into the one or more stages of the laundering cycle which occur during the operation of a drum-containing automatic fabric laundering machine, wherein laundry additive materials may be dispensed in the wash cycle, rinse cycle or both the wash and rinse cycle. In one embodiment, the dispenser has a selectively actuatable puncturing element associated with it which serves to selectively open at least a first compartment of an insert upon closing of the lid of the housing structure and/or after the insert has been positioned within the housing structure. In a more specific embodiment, the selective puncturing element is an arm having a weight and a knife. Under the centrifugal force of the spin cycle, the arm pivots the knife so that the knife ruptures the insert.

For purposes of this invention, "laundry additive materials" can comprise any solid or liquid materials which are conventionally added to the automatic washing machine drum, along with the fabrics being laundered, in order to effectively carry out the desired laundering procedure. Thus the list of suitable "laundry additive materials" includes, but is

not limited to, deterative surfactants, detergent builders, bleaches, enzymes, bleach and enzyme stabilizers, bleach and enzyme activators, aqueous and non-aqueous solvents, pH adjustment and control agents, dispersants, anti-redeposition agents, dye transfer inhibitors, preservatives, anti-microbial agents, soil release agents, anti-wrinkle agents, fabric softeners and conditioners, chelating agents, suds suppressors, suds boosters, optical brighteners, perfumes, pro-perfumes, dyes, and carriers. A more detailed description of various laundry additive materials useful in this invention can be found in WO 00/02982 and WO 00/02987.

Dispensing of laundry additive materials in accordance with this invention takes place in a conventional automatic washing machine useful for the laundering of fabrics. Such automatic washing machines are those typically found in the home or in businesses such as self-service laundromats wherein individual consumers can launder their own loads of fabrics.

Automatic washing machines of the "North American" configuration typically utilize an upright or vertical drum or tub into which fabrics to be laundered are placed. Fabrics and laundry additives are added into the washing machine tub or drum, which is usually cylindrical, from the lidded top of the machine and are thus generally referred to as "top-loading" machines. Such North American style machines will frequently utilize a vertical agitator element placed along the axis of the drum. Rotation and vertical motion of the agitator serves to intensify the contact of fabrics in the drum with wash and rinse water in the drum. Japanese washing machines are typically similar in configuration to the North American machines.

Automatic washing machines of the "European" configuration commonly utilize a drum or tub, also generally cylindrical, which is positioned with the drum axis sideways or in a horizontal position. Fabrics and laundry additive materials are placed into the tub or drum of a washing machine of this configuration through a door on the front wall of the machine and are thus generally referred to as "front-loading" machines. Automatic washing machines of the European configuration typically do not utilize an agitator device or element.

Both North American and European automatic washing machines utilize a cycle of operation wherein the machine goes through a series of steps in which water is added,

contacted with fabrics being laundered and then removed from the washing machine drum. Thus after fabrics are added to the drum, the first step in the laundering cycle is usually a washing step wherein significant amounts of water are added to the drum. The washing step involves a period wherein the fabrics being laundered are contacted with substantial amounts of water, generally with agitation or rotation of the drum. Water in the washing step will usually contain the primary laundry additives such as surfactants, builders, bleaches and/or enzymes which assist in and promote the removal of soil and stains from the fabrics being laundered.

At the conclusion of the washing step, water is removed from the washing machine drum. Frequently, this is brought about by gravity flow of wash water from the drum through appropriate valve configurations. Generally wash water is also removed by means of centrifugal force brought about by the drum rotating rapidly in a spin cycle. This centrifugal force moves water in the drum through holes or apertures in the circumferential walls of the drum. These holes lead to drainage means which can be opened and shut.

After the initial spin cycle, clean water is added back to the drum in a rinse cycle. Secondary laundry additives non-limiting examples of which include fabric softeners or conditioners are generally contacted with the fabrics being laundered during the rinse cycle. Washing machine operation may also involve several additional spinning and rinsing cycles.

The housing structure used with the insert in accordance with one embodiment of the present invention is positioned in a fixed spatial relationship to the washing machine drum. Preferably, the housing structure is rigid and is positioned within the washing machine drum in a location such that it will be in contact with the wash or rinse water in or being added to the drum during the wash and/or rinse cycles of the laundering operation. The housing structure may be positioned on or near the washing machine agitator (if there is one) or may be positioned on the floor (top loaders) or rear wall (front loaders) of the drum. Most preferably, however, the rigid housing structure will be affixed to the inner circumferential wall of the washing machine drum in a position so that at least at some point during the washing and rinsing cycles it is in contact with water used in the cycle. For

North American washing machines, this position will preferably be below the fill line for water in the drum.

The housing structure comprises a base element and an openable and closable lid for the base. Typically this arrangement involves a hinged lid on a three-dimensional base element. The three-dimensional base element can be sized and configured in order to hold in an appropriate way the insert which carries the additive materials to be dispensed.

The housing structure can be fashioned from any suitable solid material including but not limited to plastic, metal, ceramic, wood, etc. Preferably the housing structure will be fashioned from thermoformed or injection molded plastic so that it can be readily and cost effectively mass-produced.

The unit dose insert itself is sized and configured so as to work cooperatively with the housing structure into which it fits and within which it is used. The unit dose insert typically comprises at least one or more compartments at least one for laundry additive materials which are to be dispensed into the wash water at the beginning of the laundering operation and/or at least one for rinse additive materials which are to be dispensed into the subsequent rinse cycle during the course of the laundering operation. Of course, the unit dose insert may utilize more than one compartment for the wash water additive materials and/or more than one compartment for the rinse additive materials. This may be useful when two wash or rinse additive materials are incompatible with each other and may be desirably separately packaged until they are added to the washing machine drum.

Each compartment of the unit dose insert may be fashioned from water-insoluble materials, water-soluble materials or combinations of both types. Furthermore, some compartments of the insert may be made from water-insoluble materials while other compartments can be made from water-soluble materials. The compartments of the insert may also be flexible or rigid or have some compartments flexible and other compartments rigid.

The unit dose insert can have a rigid or a flexible structure or it can be formed from a combination of rigid and flexible structures, for example, a rigid panel having compartments formed from flexible films or a rigid panel having compartments formed

therein that are covered with a flexible film. If the unit dose insert may be made from any conventional polymeric material which can be thermoformed or injection molded. In one embodiment the insert is made by thermoforming wells in a relatively rigid panel, however, in forming the wells, the plastic is thinned to a more flexible thickness. Thus polyethylene, polypropylene, polystyrene or polyester (e.g., polyethylene terephthalate) may be used to form the insert. A polymer material should be chosen which has good heat stability, especially if the insert is to be utilized in European washing machines where water temperatures approach boiling. The material of the insert should also be inert to any chemicals which are present in the laundry additives which the insert is to deliver.

A suitable configuration for the unit dose insert comprises a multi-compartmented thermoformed tub formed from water-insoluble plastic, such as for example, polypropylene or polyethylene. The compartments of the tub can be sealed with a thin layer of puncturable or rupturable plastic or metal, e.g., aluminum, foil. In another preferred configuration, a pouch with the wash water additives may be flexible and fashioned from water-soluble materials, e.g., polyvinyl alcohol, and this water-soluble pouch may be affixed to a flexible or rigid pouch or compartment made from water-insoluble materials and containing the rinse additive materials to be dispensed later in the laundering cycle.

While representative examples of an insert with a "key" feature have been discussed, those skilled in the art will appreciate that other features may also be used as a "key." For example, the apertures of the insert may be of various geometrical shapes including but not limited to circular or rectangular shapes. Similarly, the post of the insert may also be of various geometrical shapes. Moreover, there may be one or more apertures or posts or a combination of both on the insert to serve as a "key." Additionally, notches at the perimeter of the insert may be of various shapes such as rectangular or circular. Other "key" features may include protrusions, tabs or extensions located anywhere on the insert. The "key" may be one feature or a combination of features on the insert to be used with a housing with corresponding features. Furthermore, the corresponding features may be located on either the base, the lid or both parts of the housing structure.

All documents cited herein are in relevant part, incorporated herein by reference. The citation of any document is not to be construed as an admission that it is prior art with

respect to the present invention. While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.